CLAIMS

What is claimed is:

1. A molecular mechanism for gene containment in sexually reproducing transgenic plants by providing a plant with a recoverable block of function (RBF) system, said system comprising:

a transgene of interest (TGI) encoding desired gene products;

a blocking construct (BC) having a capacity to block at least one molecular or physiological function essential for development or reproduction of the transgenic plant, thereby leading to death or incapacity of sexual reproduction, said BC being fully or partially inserted into an intron of the TGI; and

an externally controllable recovering construct (RC) being able to recover the functions blocked by the BC.

2. The mechanism according to claim 1, wherein the BC and the RC are located in different chromosomes.

3. The mechanism according to claim 1, wherein the BC and the RC are located in same inserts.

4. The mechanism according to claim 1, wherein the BC is barnase and the RC is barstar.

5. The mechanism according to claim 4, wherein the barnase is encoded by a synthetic nucleotide sequence SEQ ID NO:1.

6. The mechanism according to claim 4, wherein the barstar is encoded by a synthetic nucleotide sequence SEQ ID NO:2.

7. The mechanism according to claim 1, wherein the BC and the TGI are positioned in different directions.

8. The mechanism according to claim 1, wherein the BC and TGI are positioned in same direction and are sharing a polyadenylation site.

9. The mechanism according to claim 1, wherein the RC is driven by an inducible promoter.

10. The mechanism according to claim 9, wherein the promoter is physically inducible.

11. The mechanism according to claim 9, wherein the promoter is chemically inducible.

12. The mechanism according to claim 10, wherein the physically inducible promoter is a heat shock promoter.

13. The mechanism according to claim 1, wherein the BC is driven by a development or organ specific promoter.

14. The mechanism according to claim 13, wherein the development specific promoter is an embryo/germination specific promoter.

15.The mechanism according to claim 14, wherein the embryo/germination specific promoter is SH-EP promoter.

16. The mechanism according to claim 1, wherein the TGI is driven by an inducible or constitutive promoter.

17. The mechanism according to claim 16, wherein the promoter is a chemically inducible promoter.

18. The mechanism according to claim 17, wherein the promoter is salicylate inducible promoter.

19. The mechanism according to claim 16, wherein the promoter is a physically inducible promoter.

20. The mechanism according to claim 1, wherein the TGI driven by a 35S3T promoter with three tet operators, said tet operators being repressed by a product of a *tetR* gene expressed under a 35S promoter.

21. A complex of DNA constructs comprising

a TGI encoding desired gene products;

a BC having a capacity to block at least one molecular or physiological function essential for development or reproduction of the transgenic plant, thereby leading to death or incapacity of sexual reproduction, said BC being inserted fully or partially into an intron of the TGI; and

an externally controllable recovering construct (RC) being able to recover the functions blocked by the BC.

22. The complex of DNA constructs according to claim 21, wherein the BC and the RC are located in different chromosomes.

23. The complex of DNA constructs according to claim 21, wherein the BC and the RC are located in same inserts.

24. The complex of DNA constructs according to claim 21, wherein the BC is barnase and the RC is barstar.

25. The complex of DNA constructs according to claim 21, wherein the barnase comprises the SEQ ID NO:1.

26. The complex of DNA constructs according to claim 21, wherein the barstar comprises the SEQ ID NO:2.

27. The complex of DNA constructs according to claim 21, wherein the BC and the TGI are in different directions.

28. The complex of DNA constructs according to claim 21, wherein the BC and TGI are positioned in same direction and share a polyadenylation site.

29. The complex of DNA constructs according to claim 21, wherein the RC is driven by an inducible promoter.

30. The complex of DNA constructs according to claim 29, wherein the promoter is chemically inducible.

31. The complex of DNA constructs according to claim 29, wherein the promoter is physically inducible.

32. The complex of DNA constructs according to claim 31, wherein the physically inducible promoter is a heat shock promoter.

33. The complex of DNA constructs according to claim 21, wherein the BC is driven by a development or organ specific promoter.

34. The complex of DNA constructs according to claim 33, wherein the development specific promoter is an embryo/ germination specific promoter.

35. The complex of DNA constructs according to claim 34, wherein the embryo/germination specific promoter is SH-EP promoter.

36. The complex of DNA constructs according to claim 21, wherein the TGI is driven by an inducible or constitutive promoter.

37. The complex of DNA constructs according to claim 36, wherein the promoter is a chemically inducible promoter.

38. The complex of DNA constructs according to claim 36, wherein the promoter is a physically inducible promoter.

39. The complex of DNA constructs according to claim 37, wherein the promoter is salicylate inducible promoter.

40. The complex of DNA constructs according to claim 21, wherein the TGI is driven by a 35S3T promoter with three tet operators, said tet operators being repressed by a product of a *tetR* gene expressed under a 35S promoter.

41. A transgenic plant comprising the complex of DNA constructs according to claim 21.

42. A transgenic cell line comprising the complex of DNA constructs according to claim 21.